ANCHORAGE MONITORING SITES

General Information

Anchorageis a unified home rule municipality, and the largest city in Alaska. The Municipality of Anchorage has a population[1] of 260,283. Figure 1 is a topographical map showing the entire Anchorage area and surrounding geographical features. Juneau is located between the Chugach Mountains to the east, the Knik Inlet to the north, and the Turnagain Arm to the south.

The Municipality encompasses 1,697.2 square miles of land and 263.9 square miles of water.

Figure 1 – Topographical map of Anchorage area (scale = 1:250,000). Red circles indicate monitoring sites. West to Northeast are: Turnagain, Benson & Spenard, Benson & New Seward, Garden, Tudor, Muldoon, and Pargate.

[1] Population data from 2000 U. S. Census.

The average temperatures in January range from 6 to 20 degrees; in summer, temperatures range from 50 to 70. Annual precipitation is 15.9 inches, with 69 inches of snowfall.

There are seven monitoring sites in Anchorage and all are operated by Municipal staff. The sites are (in order of AIRS ID number):

02-020-0017 Benson & Spenard (CO)
02-020-0018 Garden (CO, PM_{10} and $PM_{2.5}$)
02-020-0037 Benson & Seward Hwy (CO)
02-020-0043 Muldoon (PM_{10})
02-020-0044 Tudor Road (PM_{10} and $PM_{2.5}$)
02-020-0048 Turnagain (CO)
02-020-1004 Parkgate, Eagle River (PM_{10})

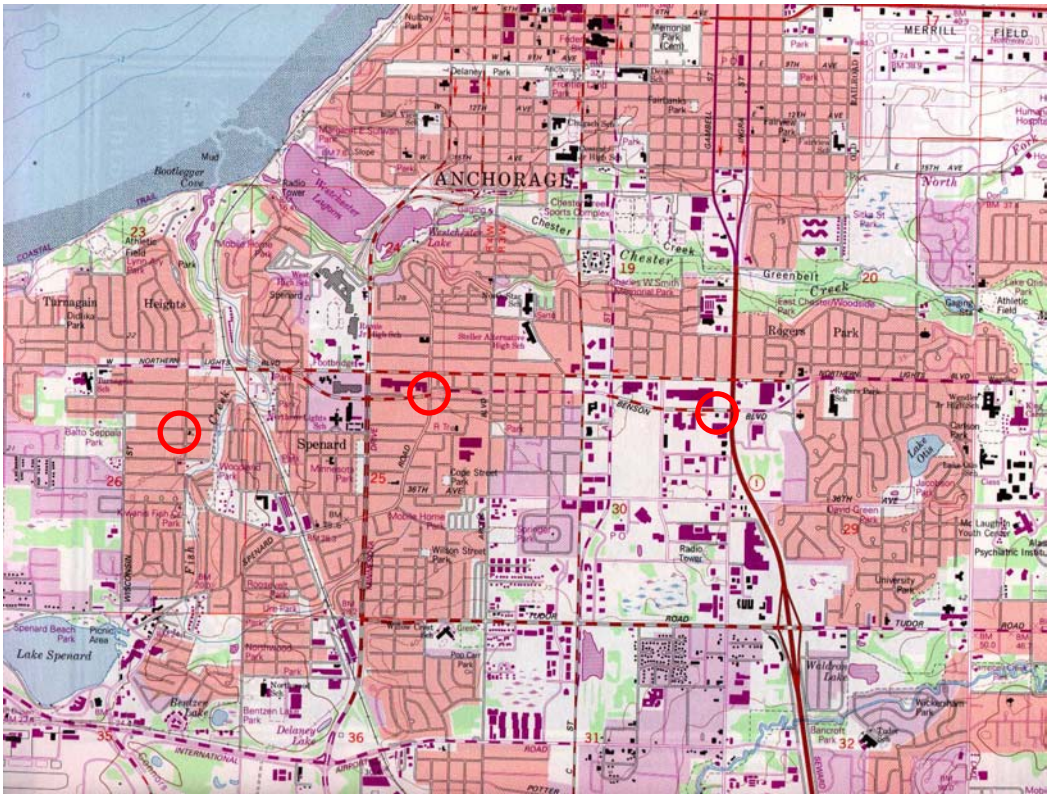

Figure 2 – Street map of western Anchorage. From west to east the sites indicated are: Turnagain, Benson and Spenard, and Benson and Seward.

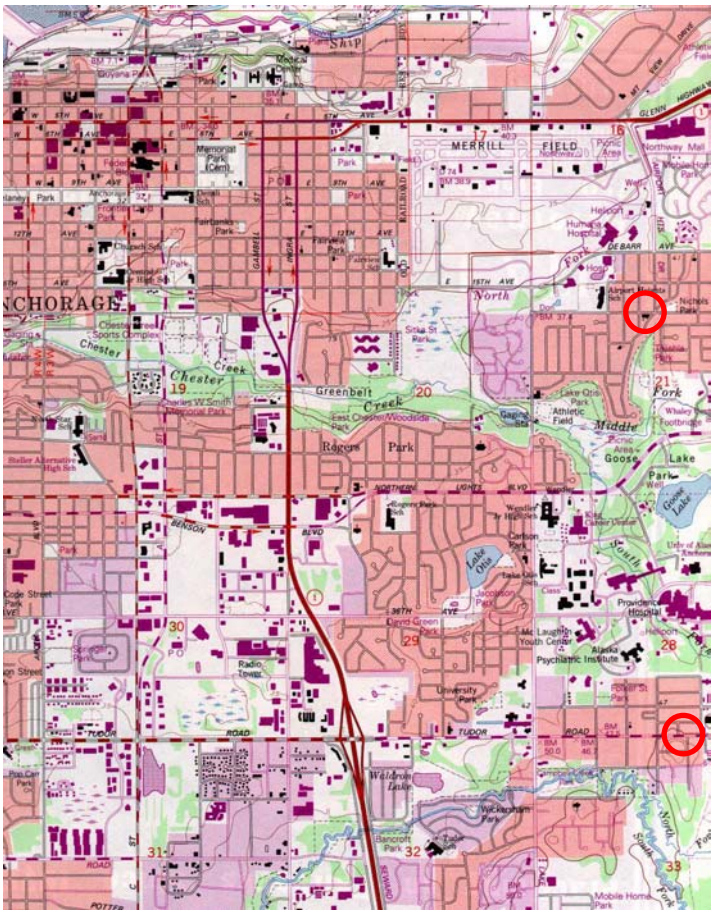

Figure 3 – Street map of central Anchorage. The northern most site indicated is Garden, and the southern site is Tudor.

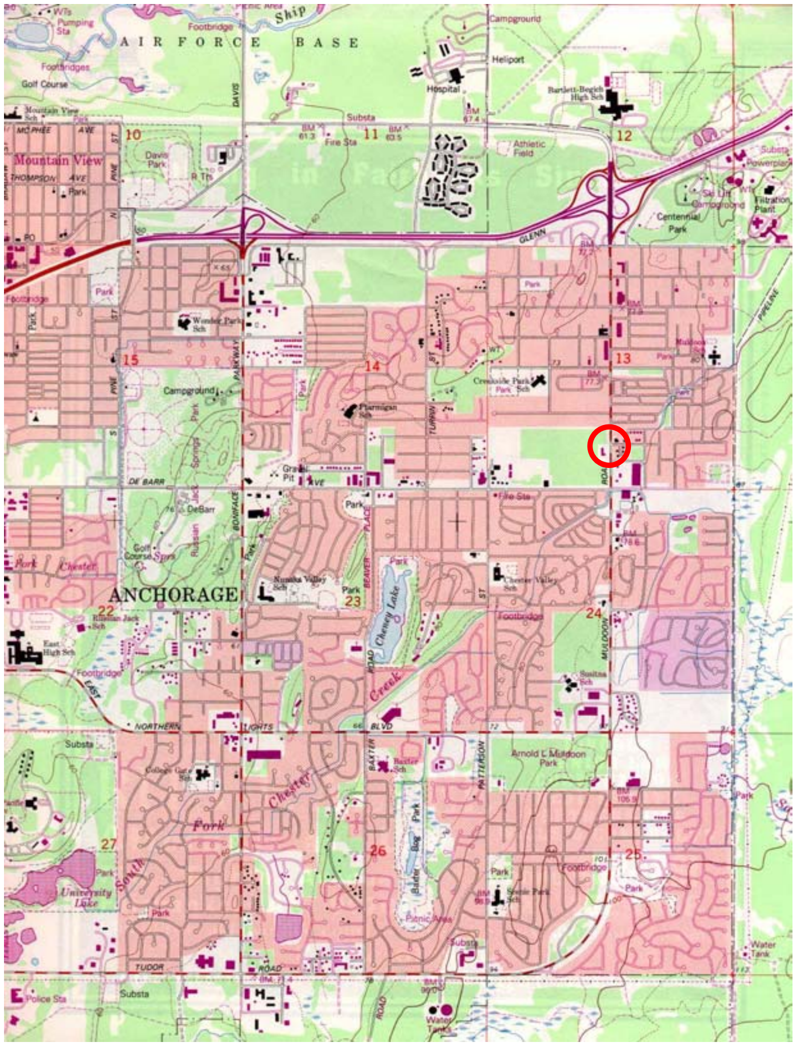

Figure 4 – Street map of eastern Anchorage. This site indicated by the red circle is Muldoon.

Figure 5 – Street map of Eagle River. This site indicated by the red circle is Parkgate.

The site descriptions for the Anchorage area were prepared with help from the staff at the Municipality of Anchorage. ADEC would like to thank MOA air quality staff for their assistance in collecting data, photographs, preparing drawings and thoroughly documenting the sites.

BENSON AND SPENARD SITE - ANCHORAGE

2902 Spenard Road **AIRS ID 02-020-0017**
Prepared 07 Sept, 2001

Site Information

The Benson and Spenard carbon monoxide monitoring site is located at the corner of Spenard Rd and Benson Blvd in Anchorage. The latitude is 61° 11' 39", and the longitude is –149° 54' 9". The ground elevation is 30 meters. Figure 2 is a street map of the west Anchorage area and Figure 6 is a drawing of the area immediately around the monitoring site. The site is located in a urban/light commercial location.

The site is within the Cook Inlet air quality control region (AIRS AQCR= 008), and is in the Anchorage, AK metropolitan statistical area (AIRS MSA= 0380). Benson and Spenard is a micro-scale, population-oriented site.

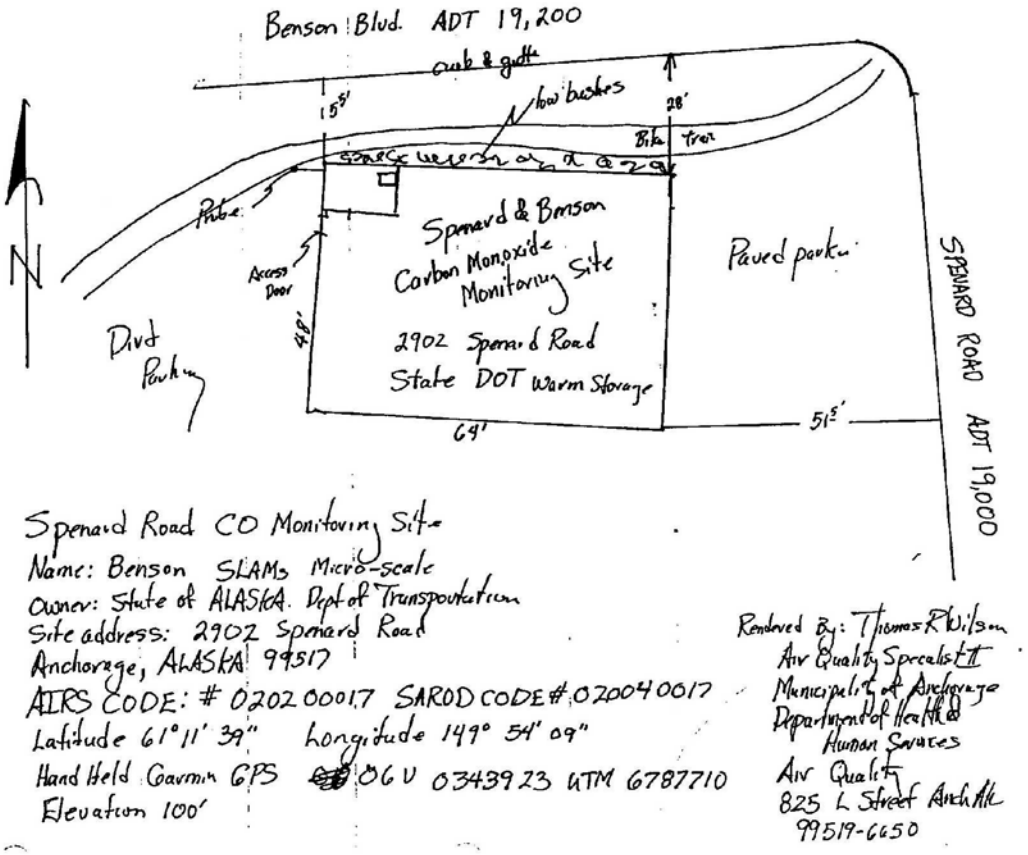

Figure 6 – Drawing of the Benson and Spenard monitoring site.

Traffic

The sampling inlet is approximately 5 meters south of Benson Blvd (19,000 average daily traffic), and 30 west of the Spenard Road intersection (19,200 average daily traffic on Spenard Rd). There are four other major roadways within 3 kilometers with approximate average daily traffic ranging from 20,000 to 60,000 vehicles per day.

The monitor is located within a heated building (owned by the State of Alaska Dept. of Transportation and Public Facilities and used for warm storage) located at the intersection. There are typical city streets and alleys and small parking lots in the vicinity.

Sources

The source of carbon monoxide within 200 meters of the inlet is predominantly automobile activity.

Anchorage International Airport (including a pond for small float planes) is 4 kilometers away to the southwest. Within 8 kilometers are Merrill Field (a small plane airport), Municipal Light and Power (90 megawatt gas turbine), Chugach Electric (48 MW gas turbine), and Elmendorf Air Force Base (22 MW gas turbine). The Alaska Railroad passes within 1 kilometer of the site.

There are large residential areas within 3 kilometers so combustion from home heating may also be a source of CO during winter months.

Monitors

The monitor is installed in a heated, empty bulding. The inlet probe is approximately 3 meters above the ground. The inlet probe is approximately 5 meters from the nearest traffic lane of Benson Blvd. Airflow is uninterrupted from Benson Blvd.

Figure 7 – Inlet probe at Benson and Spenard Site.

Equipment Installed

The monitor is a Thermo Environmental Instruments model 48 carbon monoxide analyzer. The site is operated seasonally during winter months (October 1 to March 31). The monitor was installed in 1978.

Figure 8 – View from inlet facing east. The road on the left is Benson Blvd, and the road in front is Spenard Rd.

Figure 9 – View from inlet facing north. The road is Benson Blvd.

GARDEN SITE - ANCHORAGE

3000 East 16th Avenue **AIRS ID 02-020-0018**

Prepared 07 Sept, 2001

Site Information

The Garden monitoring site is located at the Trinity Christian Reformed Church between 16th Avenue, Garden Street, and Sunruse Drive in Anchorage. This site has two carbon monoxide monitors, as well as samplers for $PM_{2.5}$ and PM_{10}. The latitude is 61° 12' 25", and the longitude is –149° 49' 15". The ground elevation is 39 meters. Figure 3 is a street map of the central Anchorage area. The site is located in a suburban, residential location.

The site is within the Cook Inlet air quality control region (AIRS AQCR= 008), and is in the Anchorage, AK metropolitan statistical area (AIRS MSA= 0380). Garden is a microscale, population-oriented CO site and a middle scale PM site.

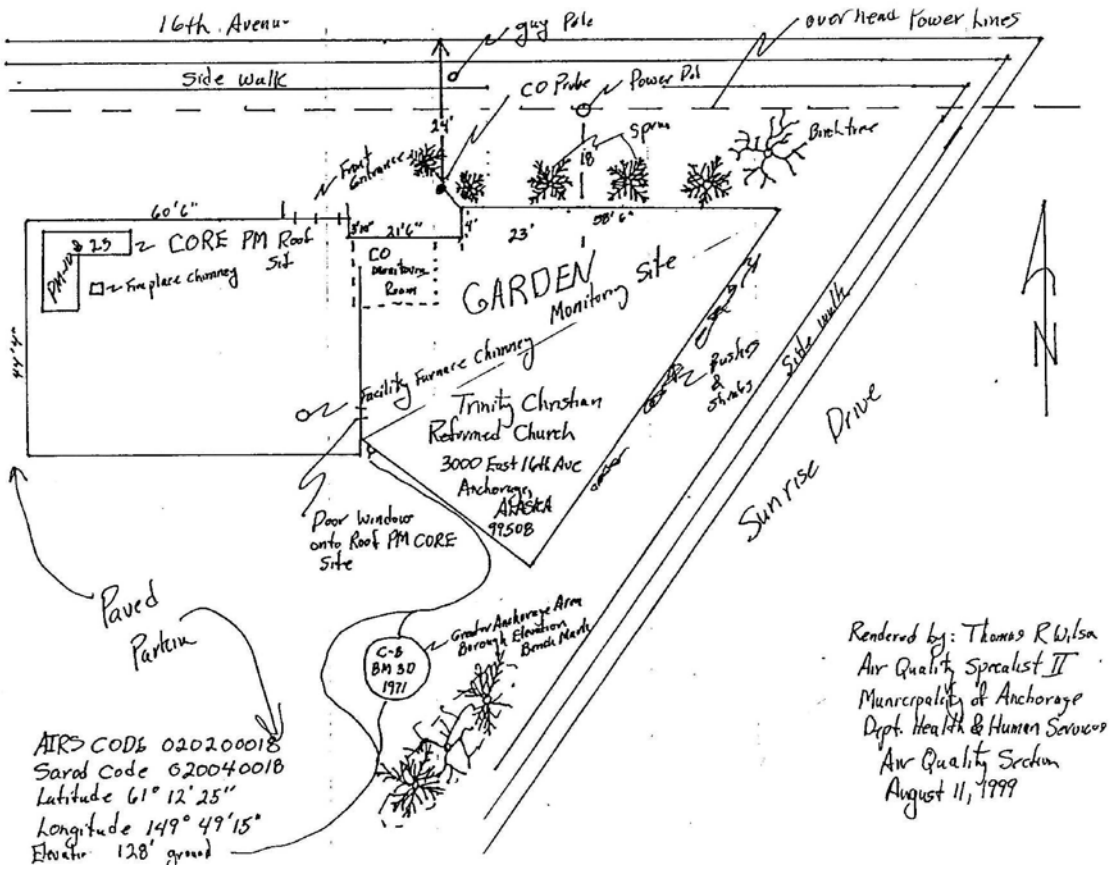

Figure 10 – Drawing of the Garden monitoring site.

Traffic

The CO sampling inlets are approximately 7 meters south of the nearest traffic lane of 16th Avenue (unknown average daily traffic). The particulate matter samplers are located approximately 8-10 meters from 16th Avenue.

There are six other major roadways within 3 kilometers with approximate average daily traffic ranging from 14,000 to 54,000 vehicles per day. There are typical residential streets and alleys in the vicinity.

Sources

The primary source of carbon monoxide and particulate matter is expected to be automobile activity. Combustion from residential heating is also expected to contribute as well. All roads are paved in the vicinity, and alleys are unpaved. Roadways are sanded for traction during winter months.

Within 8 kilometers are Merrill Field (a small plane airport), Municipal Light and Power (90 and 250 megawatt gas turbines), Chugach Electric (48 MW gas turbine), Fort Richardson Army Base (18 MW gas turbine) and Elmendorf Air Force Base (22 MW gas turbine). The Alaska Railroad passes within 3 kilometers of the site.

Anchorage is seasonally affected by wind-blown glacial loess, and occasionally affected by wildfire smoke and volcanic eruptions.

Monitors

The carbon monoxide monitors are installed in a heated storage room. The SLAMS inlet probe is approximately 3 meters above the ground on the north side of the building. The inlet probe is approximately 7 meters from the nearest traffic lane of 16th Avenue. Airflow is interrupted to the south by the two story church building (1 meter away), as well as by 14 foot tall white spruce and birch trees located 1 meter away between the church and 16th avenue. There is a second CO inlet 10 meters high that is being used for a special study. The only obstruction to that inlet is the church peak to the south.

The particulate matter samplers are located on the roof at the west end of the church. The airflow to these samplers is unobstructed.

Equipment Installed

The CO monitors are Thermo Environmental Instruments model 48 carbon monoxide analyzers. The site is operated seasonally for CO during winter months (October 1 to March 31). The monitor was installed in 1979.

The $PM_{2.5}$ samplers are Rupprecht and Patashnick model 2000 FRMs. There are three monitors operating on a 1 in 3 schedule with collocated sampling on a 1 in 6 schedule. These monitors were installed in November, 1998.

There is also a Graseby Andersen high-volume PM_{10} sampler. This sampler is operated on a 1 in 6 schedule.

Figure 11 – Garden particulate matter samplers. View faces north.

Figure 12 – Carbon monoxide inlet probe at Garden site.

Figure 13 – View to the north from the roof near the particulate matter samplers.

Figure 14 – View to the east from the roof near the particulate matter samplers.

Figure 15 – View to the south from the roof near the particulate matter samplers.

Figure 16 – View to the west from the roof near the particulate matter samplers.

BENSON AND SEWARD HIGHWAY SITE - ANCHORAGE

702 East Benson Blvd **AIRS ID 02-020-0037**
Prepared 07 Sept, 2001

Site Information

The Benson and Seward carbon monoxide monitoring site is located in the Gateway Country computer retail outlet on Benson Blvd near the New Seward Highway intersection in Anchorage. The latitude is 61° 11' 37", and the longitude is –149° 52' 5". The ground elevation is 35 meters. Figure 2 is a street map of the western area of Anchorage and Figure 17 is a drawing of the area immediately surrounding the monitoring site. The site is located in a urban, commercial location.

The site is within the Cook Inlet air quality control region (AIRS AQCR= 008), and is in the Anchorage, AK metropolitan statistical area (AIRS MSA= 0380). Benson and Seward is a microscale, population-oriented site.

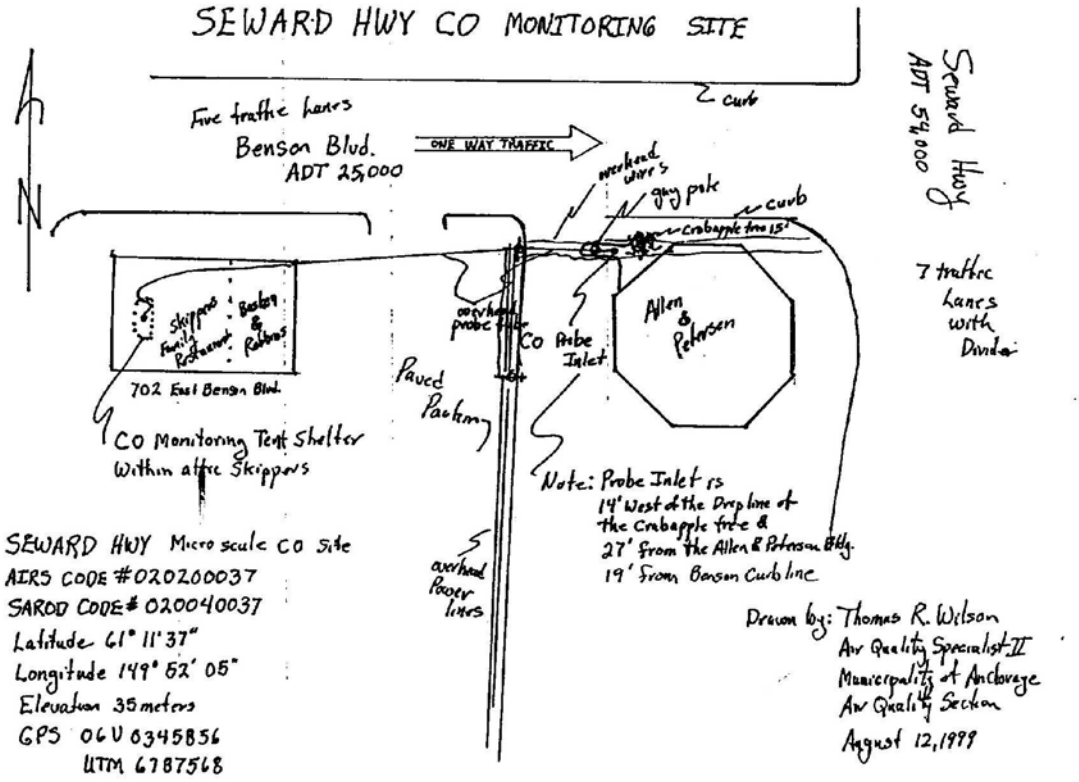

Figure 17 – Drawing of the Benson and Seward monitoring site.

Traffic

The CO sampling inlets are approximately 4 meters south of the nearest traffic lane of Benson Blvd (25,000 average daily traffic), and 20 meters west of the New Seward Highway (54,000 average daily traffic).

There are two other major roadways within 3 kilometers with approximate average daily traffic of 23,000 and 45,000 vehicles per day. There are typical urban streets, alleys, and parking lots in the vicinity.

Sources

The primary source of carbon monoxide and particulate matter is expected to be automobile activity. All roads, alleys, and parking lots are paved in the vicinity. Roadways are sanded for traction during winter months.

Within 8 kilometers are Anchorage International Airport, Merrill Field (a small plane airport), Municipal Light and Power (90 and 250 megawatt gas turbines), Chugach Electric (48 MW gas turbine), and Elmendorf Air Force Base (22 MW gas turbine). The Alaska Railroad passes within 4 kilometers of the site.

Monitors

The carbon monoxide monitor is installed in a heated storage attic. The inlet probe is approximately 3 meters above the ground on a power pole. The inlet probe is approximately 7 meters from the nearest traffic lane of Benson Blvd. There is a two story Allen and Peterson store 4 meters to the east. There are 3 meter tall decorative shrubs in the vicinity of the inlet probe.

Equipment Installed

The CO monitor is a Thermo Environmental Instruments model 48 carbon monoxide analyzers. The site is operated seasonally for CO during winter months (October 1 to March 31). The monitor was installed in October 1987.

Figure 18 – Benson and Seward inlet probe. View faces northeast.

Figure 19 – Benson and Seward inlet probe. View faces north.

Figure 20 – Benson and Seward inlet probe. View faces south.

MULDOON SITE - ANCHORAGE

1100 Muldoon Road **AIRS ID 02-020-0043**
Prepared 07 Sept, 2001

Site Information

The Muldoon PM_{10} monitoring site is located on the First National Bank of Anchorage building on Muldoon Road in Anchorage. The latitude is 61° 12' 42", and the longitude is –149° 43' 53". The ground elevation is 80 meters. Figure 4 is a street map of the east Anchorage Muldoon area and Figure 21 is a drawing of the area surrounding the moniotoring site. The site is located in a suburban, commercial location.

The site is within the Cook Inlet air quality control region (AIRS AQCR= 008), and is in the Anchorage, AK metropolitan statistical area (AIRS MSA= 0380). Muldoon is a middle scale, population-oriented site.

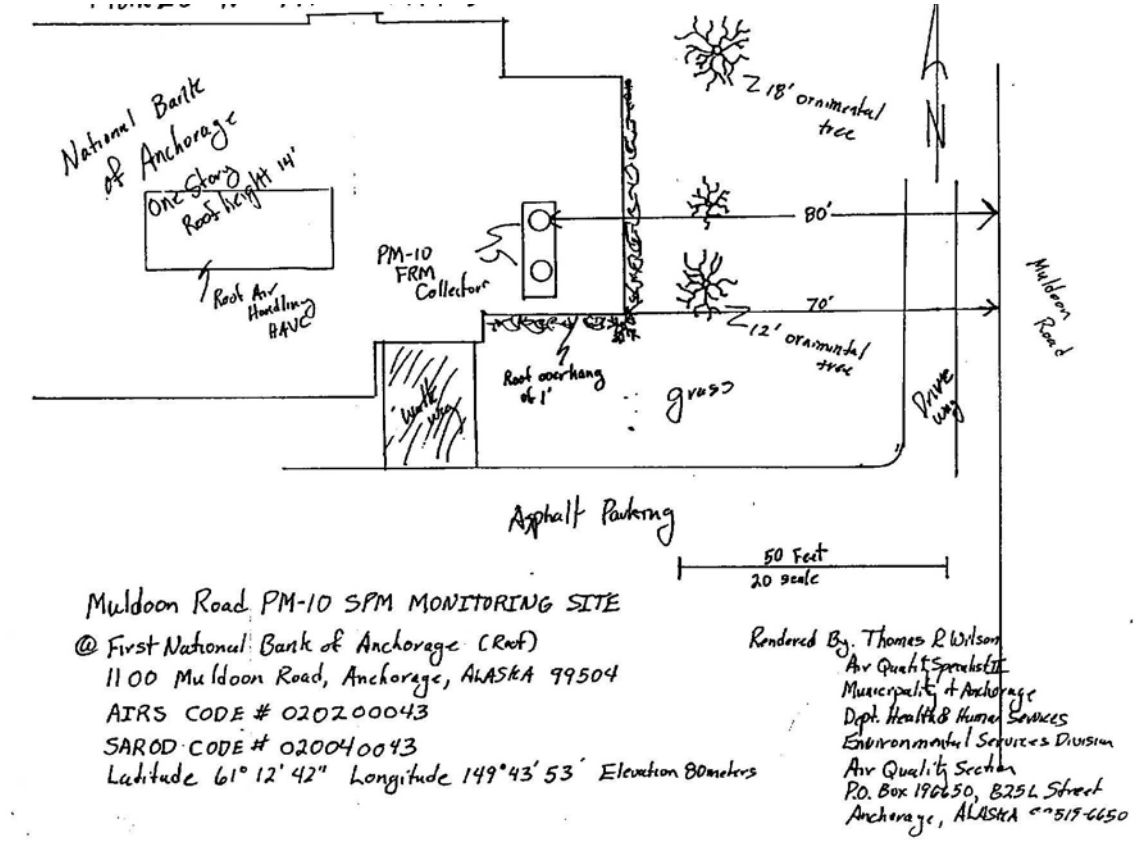

Figure 21 – Drawing of the Muldoon monitoring site.

Traffic

The samplers are approximately 24 meters west of the nearest traffic lane of Muldoon Road (32,500 average daily traffic).

There are three other major roadways within 3 kilometers with approximate average daily traffic ranging from 19,000 to 54,000 vehicles per day. There are typical

residential and commercial streets and alleys in the vicinity. All roads are paved; alleys are dirt.

Sources

The primary source of particulate matter is expected to be automobile activity. Roadways are sanded for traction during winter months. Within 200 meters of the site land use is predominantly small businesses, single family homes, and appartments.

Within 8 kilometers are Merrill Field (a small plane airport), Municipal Light and Power (90 and 250 megawatt gas turbines), and Elmendorf Air Force Base (22 MW gas turbine). The Alaska Railroad passes within 5 kilometers of the site.

Anchorage is seasonally affected by wind-blown glacial loess, and occasionally affected by wildfire smoke and volcanic eruptions.

Monitors

The particulate matter samplers are located on the roof at the east end of the bank. The roof height is 3.5 meters, and there are no other structures. No trees in the vicinity significantly exceed the height of the samplers. The airflow to these samplers is unobstructed.

Figure 22 – Muldoon particulate matter samplers. View faces north.

Equipment Installed

There are two Graseby Andersen high-volume PM_{10} samplers. This samplers are operated on a 1 in 2 schedule. This site is generally only operated seasonally when meteorological conditions are warm and dry enough to indicate that traction sand from

the roadways might become airborne in late winter and spring, but has not yet been effectively swept up.

Figure 23 – Muldoon particulate matter samplers. View faces north.

Figure 24 – Muldoon particulate matter samplers. View faces east. Muldoon Road is visible in the background.

Figure 25 – Muldoon particulate matter samplers. View faces south.


Figure 26 – Muldoon particulate matter samplers. View faces west.

TUDOR SITE - ANCHORAGE

3335 East Tudor Road **AIRS ID 02-020-0044**
Prepared 07 Sept, 2001

Site Information

The Tudor $PM_{2.5}$ and PM_{10} monitoring site is located on the Allstate Insurance Company building on Tudor Road in Anchorage. The latitude is 61° 10' 56", and the longitude is –149° 48' 50". The ground elevation is 50 meters. Figure 3 is a street map of the central Anchorage area and Figure 27 is a drawing of the area immediately surrounding the Tudor site. The site is located in a urban, commercial location.

The site is within the Cook Inlet air quality control region (AIRS AQCR= 008), and is in the Anchorage, AK metropolitan statistical area (AIRS MSA= 0380). Tudor is a microscale, population-oriented site.

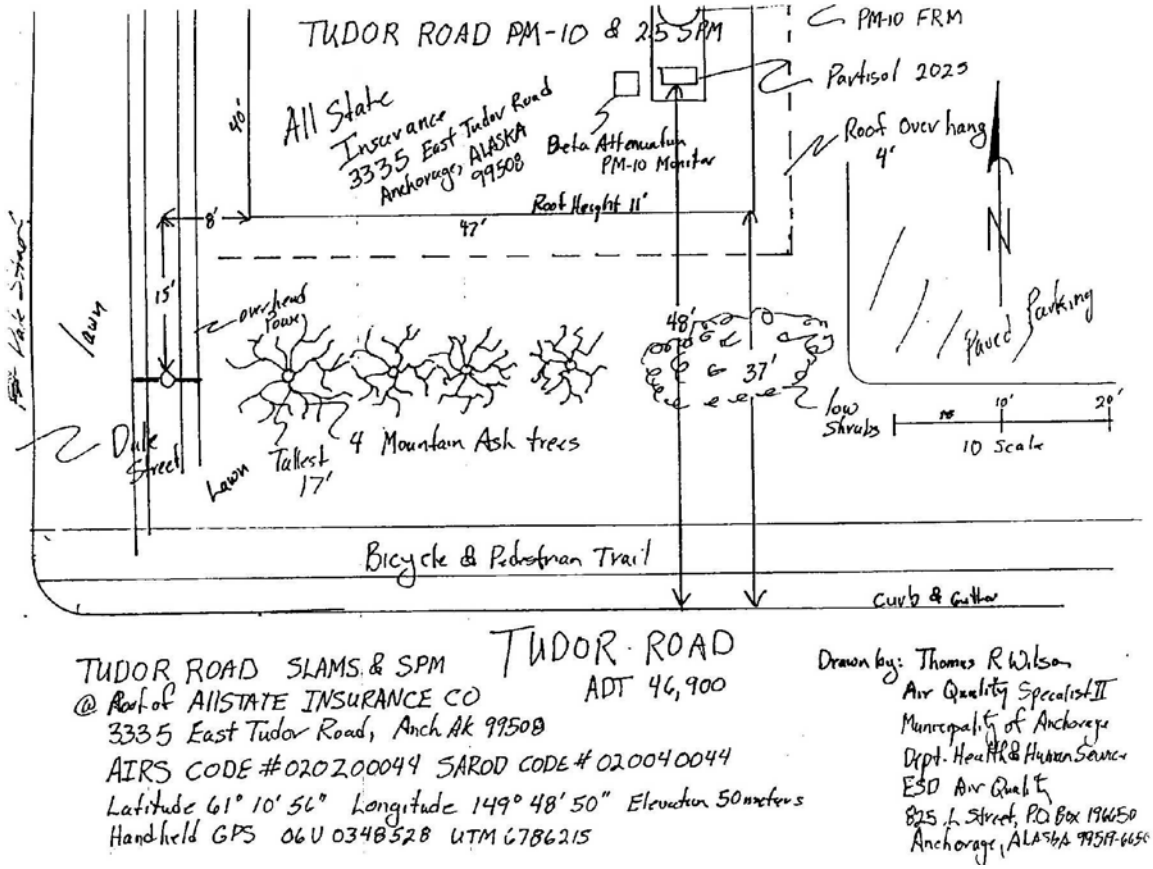

Figure 27 – Drawing of the Tudor monitoring site.

Traffic

The samplers are approximately 7 meters north of the nearest traffic lane of Tudor Road (46,900 average daily traffic).

There are three other major roadways within 3 kilometers with approximate average daily traffic ranging from 30,000 to 54,300 vehicles per day. There are typical

residential and commercial streets and alleys in the vicinity. All roads are paved; alleys are dirt.

Sources

The primary source of particulate matter is expected to be automobile activity. Roadways are sanded for traction during winter months. Within 200 meters of the site land use is predominantly small businesses, raodways, and parking lots. There are also single family homes and appartments in the vicinity.

Within 8 kilometers are Anchorage International Airport, Merrill Field (a small plane airport), Municipal Light and Power (90 and 250 megawatt gas turbines), Chugach Electric (48 MW gas turbine), and Elmendorf Air Force Base (22 MW gas turbine). The Alaska Railroad passes within 6 kilometers of the site.

Anchorage is seasonally affected by wind-blown glacial loess, and occasionally affected by wildfire smoke and volcanic eruptions.

Monitors

The particulate matter samplers are located on the roof near the southeast edge. The roof height is 3.3 meters, and there are no other structures. Seventeen foot tall mountain ash trees between the samplers and the roadway do not significantly exceed the height of the samplers. The airflow to these samplers is unobstructed.

Figure 28 – Tudor particulate matter samplers. View faces west.

Equipment Installed

There are three Graseby Andersen high-volume PM_{10} samplers. This samplers are operated on a 1 in 2 schedule. Collocated samples are collected at this site for precision determination. Sampling began here in October 1996.

The $PM_{2.5}$ samplers are Rupprecht and Patashnick model 2000 FRMs. There are two monitors operating on a 1 in 3 schedule. These monitors were installed in January, 1999.

Figure 29 – Tudor samplers. View faces north.

Figure 30 – Tudor samplers. View faces east.

Figure 31 – Tudor samplers. View faces south.

Figure 32 – Tudor samplers. View faces west.

TURNAGAIN SITE - ANCHORAGE

3201 Turnagain Street **AIRS ID 02-020-0048**

Prepared 07 Sept, 2001

Site Information

The Turnagain carbon monoxide monitoring site is located at the corner of Turnagain Street and 32nd Avenue in Anchorage. The latitude is 61° 11' 32", and the longitude is –149° 56' 9". The ground elevation is 21 meters. Figure 2 is street map of the western part of Anchorage and Figure 33 is a drawing of the Turnagain site. The site is located in a suburban location.

The site is within the Cook Inlet air quality control region (AIRS AQCR= 008), and is in the Anchorage, AK metropolitan statistical area (AIRS MSA= 0380). Turnagain is a neighborhood scale, population-oriented site.

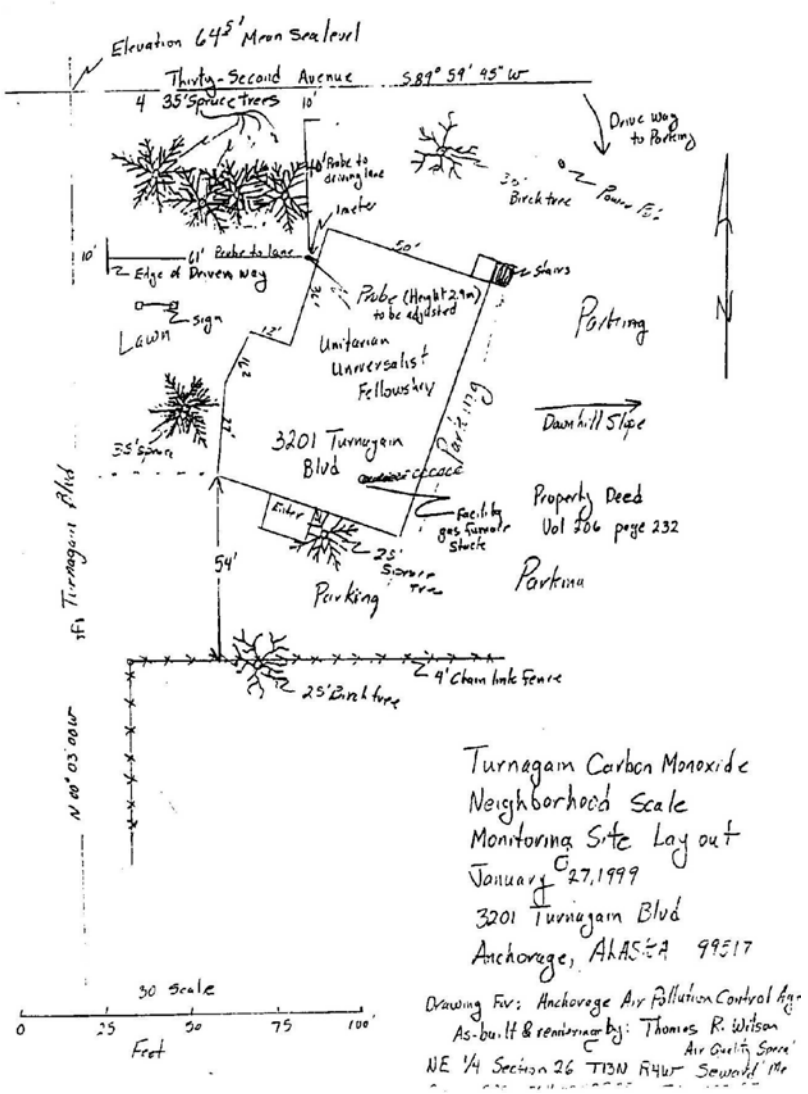

Figure 33 – Drawing of the Turnagain carbon monoxide monitoring site.

Traffic

The sampling inlet is approximately 18.5 meters east of Turnagain Street (approximately 5,000 average daily traffic), and 12 meters south of 32nd Avenue (approximately 500 average daily traffic). There are five other major roadways within 3 kilometers with approximate average daily traffic ranging from 18,000 to 54,000 vehicles per day.

The monitor is located within the Unitarian Universalist Fellowship Church. There are residential streets and alleys in the vicinity.

Sources

The source of carbon monoxide within 200 meters of the inlet is predominantly automobile activity. Land use is predominantly single family homes, trailer parks and appartments.

Anchorage International Airport (including a pond for small float planes) is 1 kilometers away to the southwest. Within 8 kilometers are Merrill Field (a small plane airport), Municipal Light and Power (90 megawatt gas turbine), Chugach Electric (48 MW gas turbine), and Elmendorf Air Force Base (22 MW gas turbine). The Alaska Railroad passes within 0.5 kilometer of the site.

Figure 34 – Turnagain carbon monoxide inlet probe. View faces southwest.

Monitors

The monitor is installed in the Unitarian church. The inlet probe is approximately 3 meters above the ground. The inlet probe is approximately 18.5 meters from the

nearest traffic lane of Turnagain Street. Between the inlet and Turnagain St are several tall white spruce trees. The church itself obstructs air flow from the south and east.

Equipment Installed

The monitor is a Thermo Environmental Instruments model 48 carbon monoxide analyzer. The site is operated seasonally during winter months (October 1 to March 31). The monitor was installed in October 1998.

Figure 35 – View from Turnagain inlet probe. View faces north.

Figure 36 – View from Turnagain inlet probe. View faces east.

Figure 37 – View from Turnagain inlet probe. View faces west.

PARKGATE, EAGLE RIVER- ANCHORAGE

11723 Old Glenn Highway **AIRS ID 02-020-1004**

Prepared 07 Sept, 2001

Site Information

The Parkgate PM_{10} monitoring site is located on the Parkgate Business Center building in Eagle River (a bedroom community of Anchorage that lies well within the Municipality). The latitude is 61° 19' 27.5", and the longitude is –149° 33' 15". The ground elevation is 100 meters. Figure 5 is a street map of the western Eagle River area and Figure 38 is a drawing of the Parkgate site. The site is located in a suburban, commercial location.

The site is within the Cook Inlet air quality control region (AIRS AQCR= 008), and is in the Anchorage, AK metropolitan statistical area (AIRS MSA= 0380). Muldoon is a neighborhood scale, population-oriented maintenance monitoring site.

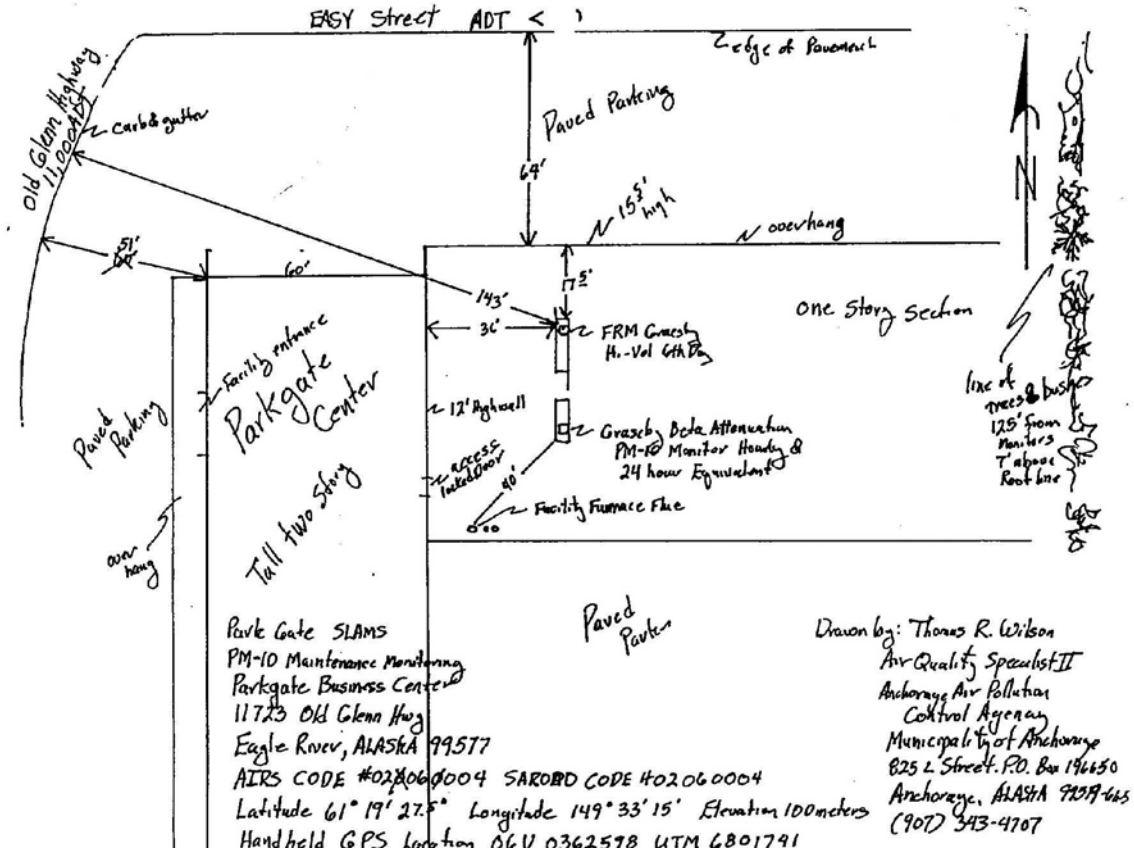

Figure 38 – Drawing of the Parkgate particulate matter monitoring site.

Traffic

The samplers are approximately 44 meters east of the nearest traffic lane of the Old Glenn Highway (11,000 average daily traffic), and 23 meters north of Easy Street (unknown average daily traffic).

There is only one other major roadway within 3 kilometers; the Glenn Highway has approximately 23,000 average daily traffic. There are typical residential and commercial streets and alleys in the vicinity. All roads are paved.

Sources

The primary source of particulate matter is expected to be automobile activity. Roadways are sanded for traction during winter months. Within 200 meters of the site land use is predominantly small businesses, and appartments.

Fort Richardson army base is within 8 kilometers (active military airport, 18 MW gas turbine). The Alaska Railroad passes within 5 kilometers of the site.

There is a furnace flue 12 meters southwest of the samplers.

Parkgate is seasonally affected by wind-blown glacial loess, and occasionally affected by wildfire smoke and volcanic eruptions.

Monitors

The particulate matter samplers are located on the roof of the first story of the Parkgate Business Center. The roof height is 5 meters. There is another section of the building 13 meters to the west that is two stories tall (4 meters above the first story roof height). No trees in the vicinity significantly exceed the height of the samplers. The airflow to these samplers is unobstructed.

Equipment Installed

There is one Graseby Andersen high-volume PM_{10} sampler. This sampler is operated on a 1 in 6 schedule. There is also a Graseby Andersen beta-attenuation monitor at this site operating continuously. This site was established in 1974. PM_{10} monitors were installed in 1985.

Figure 39 – Parkgate samplers. View faces south.

Figure 40 – Parkgate samplers. View faces north.

Figure 41 – Parkgate samplers. View faces east.

Figure 42 – Parkgate samplers. View faces south.

Figure 43 – Parkgate samplers. View faces west.